REDRING

POWERSTREAM ASCARI

MODEL N° 45-551860 PSA 12

INSTALLATION GUIDE

Ref. : 1871184 - 11.031

Please ensure that this Guide is passed to the end user on completion of the installation

CONTENTS

Installation Quick Reference Guide

1.1 - Quick reference guide ONLY

1 It is recommended that the boiler be connected to an off-peak tariff or similar, that provides some daytime off-peak hours.

2 Where the off-peak tariff is restricted, a change-over relay should be used to switch power to the boiler when the off-peak supply is not available.

3 Ensure the following is carried out before turning on the power supply:

3.1 The system is filled with water and has been flushed thoroughly before letting any air / water through the pressure relief valve (particles of dirt could prevent the valve closing properly).

3.2 Check that the system is full by turning the pressure relief valve cap, ensure that water exits correctly through the discharge pipe and that the valve seals correctly when finished.

3.3 An external pressure gauge should be used to check the system pressure when cold. The pressure should be set between 1 & 1.5bar. All air should be removed from the system before measuring the system pressure.

4 If no external pressure gauge is available, it is possible to check the system pressure as follows:

4.1 With the electricity supply 'OFF' remove the bridge between terminals # 10 & # 11 to isolate the heating elements and prevent them being energised

4.2 Turn the electricity supply 'ON' and fill the boiler using the pressure gauge on the front display panel to monitor & set the cold system pressure

4.3 Once set at 1 to 1.5 bar, turn 'OFF' the electricity supply and refit the bridge to its original position between terminals # 10 & # 11

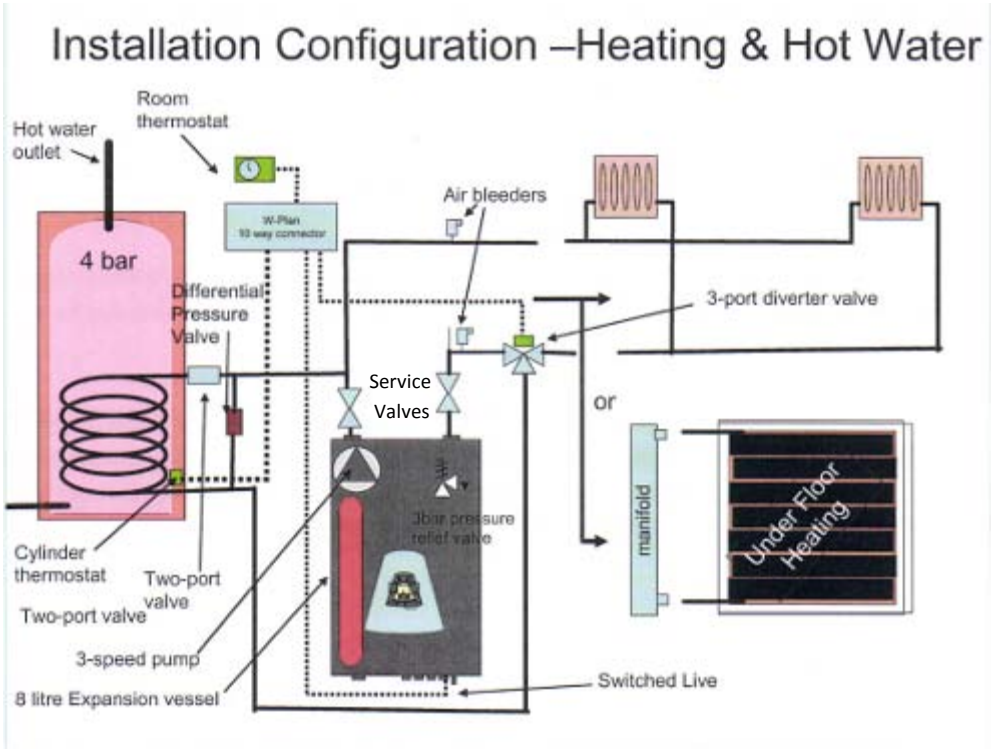
1.2 - Installation Options

1 Space Heating Only (recommended) - Direct Room Thermostat Connection

- The no-volts contacts of the room thermostat should be connected to terminals # 1 & # 2 of the boiler. **WARNING - a switched live must not be connected to these terminals.**
- Menu parameter # 04 should be set to '01' to allow the boiler to be controlled from the room thermostat (see Section 1.3, option # 2, Note below).
- **Note that the boiler will not operate correctly if the thermostat is not connected**

2 Operating with a Hot-Water Cylinder

Redring strongly recommend that a direct electric, unvented cylinder be used for the production and storage of the hot water as this will be cheaper than an indirect cylinder; will require less plumbing (piping and valves) and is more thermally efficient.



When using the boiler for unvented hot water and heating, the two-port motorised valve should be inserted in the flow from the boiler.

A Differential Pressure valve should then be connected between the flow and return at a point between the boiler and the two-port motorised valve.

1.3 - Boiler (serial numbers of 0500151 and above)

There are two options available:

Option # 1 - Operating from a switched live (where external thermostatic control is not available or required) - Circuit diagram 2.7.1 - page 18

1 The switched live (taken from a spare live feed on the primary connector block that feeds terminal L1 on the contactors) should be connected to terminal # 25 which is located below the relay (lower right hand side of the electrical panel) using cable of 0.5 to 1.0mm minimum cross section (refer to diagram **Section 2.6.3.1**)

2 In the set-up menu, set parameter # 02 (maximum central heating circuit temperature) to a level that will provide both hot water and central heating at a safe level

3 In the set-up menu, set parameter # 04 to '01'

4 In the set-up menu, set parameter # 06 to '00' (auto-adaptability 'OFF')

5 The boiler should be set to operate in 'Winter' mode (press and hold the radiator symbol on the control panel until the snowflake symbol illuminates) This allows both central heating **&** hot water production.

6 All other parameters in the set-up menu should be set as per the menu in paragraph 1.4 below

7 Press the symbol to display the requested temperature (flashing in front of °C)

8 Press or to increase or decrease the requested temperature to a level between the Max and Min boiler temp (see parameters # 2 & # 3 of the boiler configuration listing - **Section 2.10.1**)

9 Press the symbol to confirm the setting and return to normal display

Option # 2 - Operating with a Cylinder Thermostat & Room Thermostat (Circuit diagram 2.7.2 - page 19)

1 Move the two brown wires from terminals # 1 & # 2 to terminals # 5 & # 6 respectively (1 to 5 and 2 to 6)

2 The no-volt, normally open contacts of the room thermostat should be connected to terminals # 1 & # 2 **WARNING - a switched live must not be connected to these terminals.** See also **Section 2.6**

3 The cylinder thermostat, 240v, normally open contact (taken from a spare live feed on the primary connector block that feeds terminal L1 on the contactors) should be connected to terminal # 25 which is located below the relay (lower right hand side of the electrical panel). Refer to diagram **Section 2.6.3.2**

4 In the set-up menu:

- set parameter # 04 to '01' (see note below)
- set parameter # 12 to '01'
- set parameter # 13 to '00'

5 All other parameters in the set-up menu should be set as per the menu in paragraph 1.4 below

Note that if you have selected parameter # 4 or # 12 to '01' in order to use a room thermostat or hot water cylinder thermostat, the boiler will not operate correctly until these devices are connected.

1.4 - Menu Parameters

The set-up menu should be configured as follows (some parameters may be modified by instructions in the previous sections)

Parameter	Setting	
02	**80°C**	or as required between 21° and 80°C
03	**30°C**	or as required up to the maximum temperature set at parameter # 02 above
04	**01**	select '01' **only** if a room thermostat is installed; do **not** select '02'
05	**01**	only available if parameter # 04 is set to '01'
06	**01**	recommended (unless instructed otherwise)
07	**00**	mandatory (sensor not supplied in the UK)
11	**02**	user defined 1 to 6 minute delay in switching the elements
12	**00**	mandatory
13	**00**	mandatory (note that the sensor for this parameter is not supplied in the UK)
15	**00**	mandatory
16	**01**	for 12kW boiler operation
23	**00**	mandatory

1.5 - Summer / Winter mode

The snowflake symbol (upper right of the control panel) should be illuminated indicating operation in the winter mode. If the sunshine symbol is illuminated, select winter mode by pressing and holding the button with the radiator symbol for 3 seconds. In summer mode, the heating circuit is switched off but hot water (if installed) will still be produced.

1.6 - Under-floor Heating

If used for under-floor heating, the 60°C thermal cut-out should be selected (refer to **Section 2.6.1**) with parameter 02 set to a max of 50°C & parameter 03 set to a minimum of 21°C.

Where both under-floor heating and hot water production are used in the same heating circuit, it is necessary to use the 100°C thermal cut-out in the boiler and include a separate 60°C thermal cut-out for the under-floor heating circuit.

1.7 - WARNING - Heating circuit water treatment

Filling water - the heating circuit in this boiler is manufactured from a variety of materials and it is possible that some signs of corrosion may appear due to galvanic action.

The circuit must be filled with untreated drinking water only and not from a water softening system. Filling from another source (well, drilling, etc) will cancel the warranty.

Treatment of the heating circuit

The use of Ethylene Glycol with an approved corrosion inhibitor is strongly recommended. Glycol ratio to be under 10%

Heating circuits must be cleaned in order to remove any deposits resulting from the installation and from chemical reactions from differing materials.
Protecting the circuit from corrosion, scaling and microbiological elements is compulsory, using a corrosion inhibiting fluid that is specifically recommended for heating circuits containing different materials.

Air Purge

Air in a heating system can be extremely corrosive therefore it is strongly advised to have manual air bleeders at the highest points in the heating circuit as well as on each radiator.

Any deterioration of the boiler resulting from a failure to fill the system with a corrosion inhibiting fluid and/or from a failure to purge all air from the system will result in the cancellation of the warranty

NOTE - British Standard BS7593:1992 stresses the importance of cleansing and flushing of the system to ensure it continues to run efficiently with the minimum of maintenance necessary.

Redring Xpelair Group fully supports this professional approach and recommends that the system is cleaned with an effective chemical cleanser and then protected long-term with a suitable inhibitor. Such products are available from Fernox and Sentinel.

Installation & Configuration Instructions

Features

- Selectable water temperature for either radiator or under-floor heating (21 - 80°C)
- 100°C or 60°C thermal cut-out for either radiator or under-floor heating (respectively)
- Room thermostat operation
- Frost protection (5°C minimum temperature)
- Pump protection (pump operates for one minute every 24 hrs when system is in summer mode)
- Pump over-run facility
- Stage stepped turn on/off
- Weekly alternative start-up
- Switch operation counter (for diagnostics)
- System pressure display

Water Heating

It is strongly recommended that the boiler be used for central heating purposes only and that hot water be stored and heated by a direct electric hot water cylinder. This allows hot water to be heated overnight on an Off Peak Tariff and also reduces heat losses between the boiler and the cylinder.

2.1 - Introduction

The Redring Powerstream Ascari boiler is an all electric, domestic central heating boiler suitable for use on a 230v, 52A, 50 Hz supply. The unit is easy to install and requires no flue making it ideal for apartments or properties in conservation areas.

The unit is supplied ready for operation as a 12kW, 230v (13 kW, 240v) single phase boiler that will automatically modulate down to 10, 8, 6, or 4 kW as required. The maximum output power may also be manually limited to operate at maximum power levels of 10, 8, 6, or 4 kW with the boiler proportionally modulating to lower power levels.

Finished in a clean white case and with dimensions of 620mm x 405mm, the boiler is suitable for installation in a kitchen area. With selectable thermal cut-outs of either 60° or 100°C, the boiler is suitable for standard wet radiator systems or under-floor heating.

There are no specific ventilation requirements associated with the operation of this boiler however it is recommended that the room is dry and well ventilated.

2.2 - Important Information

This appliance is not intended for use by persons (including Children) with reduced physical sensory or mental capabilities, or lack of experience and/or knowledge, unless they have been given supervision and/or instruction concerning the use of the appliance by persons responsible for their safety.

Children should be supervised at all times to ensure that they do not play with the appliance.

- The information given in this booklet is a guide only. All installations must follow the current regulations for this type of device and where no information, or conflicting information, is given in this guide, the current regulations will apply.
- Disconnect the electricity supply before attempting to remove the front cover of this boiler.
- This boiler weighs 38kg and requires two persons to lift it into position for installation. Please ensure that the wall onto which it is to be installed, and all mounting fixings, are capable of taking the weight of the unit plus its water content.
- The heating system must only be installed by a competent person in accordance with the current regulations in force at the time.
- All wiring should conform to the regulations in force at the time of installation. This appliance is approved to a protection rating of IPX1 therefore if it is to be installed in a room containing a bath or shower, any electrical switch or control utilising mains electricity must be situated such that it cannot be touched by persons using the bath or shower. Attention is drawn to the requirements of the current BS7671 (I.E.E.Wiring Regulations) and in Scotland, the electrical provisions of the building regulations applicable in Scotland.
- Complete all plumbing work before connecting the boiler to the electricity supply
- This appliance must be earthed!
- The boiler should be permanently connected to the electricity supply, direct from a 63A fused supply on the consumer unit via a double pole linked switch with a minimum contact gap of 3mm. No other appliances should be powered from this supply.
- The expansion vessel is pre-charged to 1bar (0.1 MPa). During installation and before operating the boiler, this should be checked using a suitable pressure gauge.
- A 3bar (0.3 MPa) pressure relief device is incorporated within the product. The cold system pressure should not exceed 1.5bar (0.15 MPA).
- When used with radiators fitted with Thermostatic valve controls, the heating system must have a bypass radiator fitted capable of circulating water at 350 litres per hour.
- The system must be flushed prior to finally connecting the boiler, in order to remove any debris from the pipework. Do not use the fitted pressure relief valve to flush the system as particles may get trapped in the valve and cause incorrect operation.
- The outlet of the pressure relief valve should discharge to a tundish connected to waste; should fall continuously and terminate so that water/steam may be safely discharged and visible. Should any water/steam be seen to be venting from this outlet, the boiler electricity supply should be switched off immediately and the Redring Xpelair Group Customer Service Centre contacted.
- A drain cock should be installed at the lowest point in the heating system to allow the water in the system to be drained as fully as possible

Continued Overleaf

- Whilst the boiler and heating system may be filled from the cold mains water supply, the boiler must be isolated from this supply by a suitable break in the supply pipe during normal operation.
- This boiler is not fitted with a filling loop. Any loop being fitted must comply with the Water Supply (Water Fittings) regulations in force at the time of installation. A filling loop should be fitted at some point to allow the CH system to be filled.
- The boiler must be installed in an upright position, away from nearby objects (see installation section for relevant clearances) in a clean, dry, frost free place.

2.3 - Technical Specification

ELECTRICAL

Supply	12kW @ 230v, 52A, 50Hz / 13kW @ 240v, 54A, 50Hz	
Maximum Power Output	12 kW manually convertible to 10, 8, 6 or 4 kW	
Modulation	Automatic three or four stage reduction in 2 kW steps	
	12 kW -	10-8-6
	10 kW -	8-6-4
	8 kW -	6-4-2
	6 kW -	4-2
Fuse requirements	63Amp	
Cable size	3 x 16mm^2 (Live, Neutral & earth)	

PERFORMANCE

Water pressure	Minimum	0.5 bar (0.05 MPa)
	Maximum	2.5 bar (0.25 MPa)
	Nominal	2 bar (0.2 MPa)
Operating Water Temperature	Minimum	21°C
	Maximum	80°C
Water Flow Rate	Minimum	350 litres/hour
	Maximum	1400 litres/hour
	Nominal	700 litres/hour
Thermal Limits	Radiators	100°C
	Under-floor	60°C

MECHANICAL

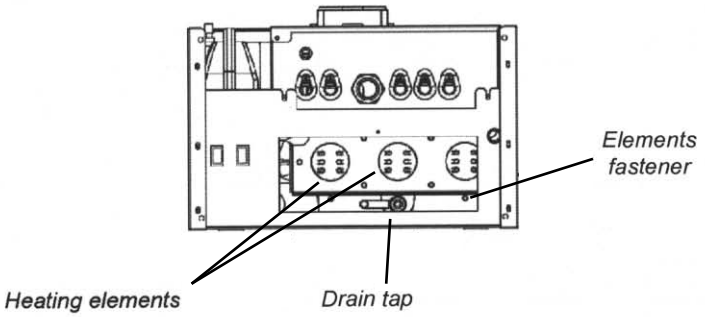
Weight	38kg	Dimensions	H 620mm x W 405mm x D 280mm
Capacity	5 litres	Elements	2 heaters / 3 x 2 kW Incoloy elements
Rating	IPX1	Pump	3 speed manually selectable
Expansion vessel	8 litres	Exchanger	Cast Iron
Connections	1” (26/34) Female	Cut-outs	1 x 60°C / 1 x 100°C

2.3.1 - Key Features

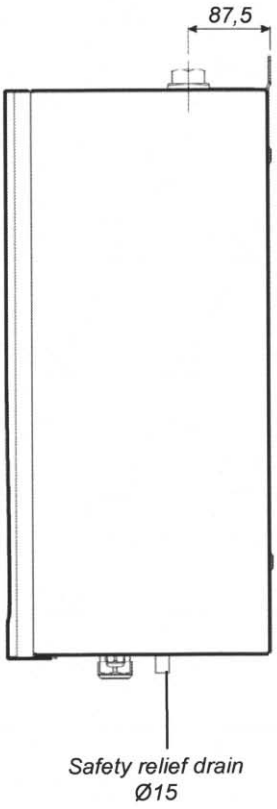
Key

1 - 3 speed pump
2 - 8 litre expansion vessel
3 - 3 bar safety relief bleeder
4 - Low level water sensor
6 - 60°C thermal cut-out
7 - 100°C thermal cut-out
8 - Boiler's sensor
9 - Control panel
11 - Fuse (inside panel

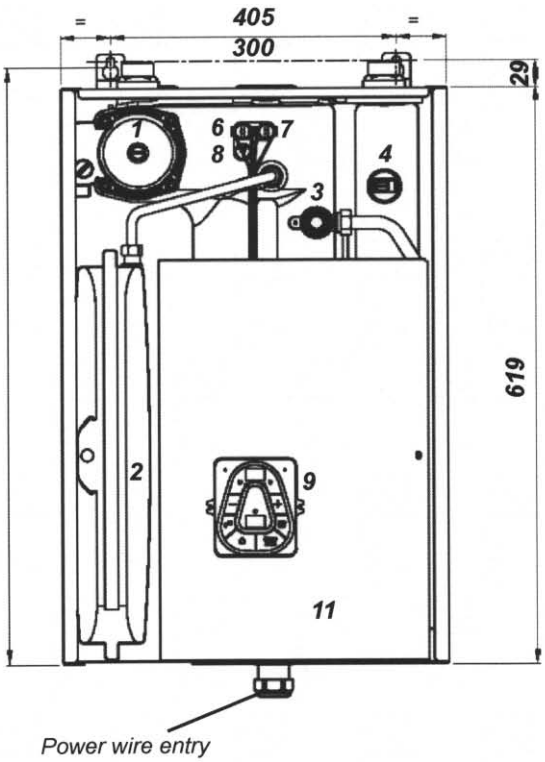
Bottom view
(Trapdoor to access elements removed)



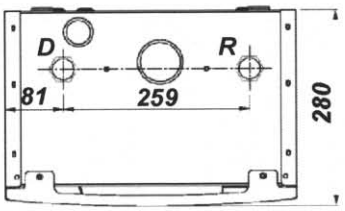
Side view



Front view



Top view

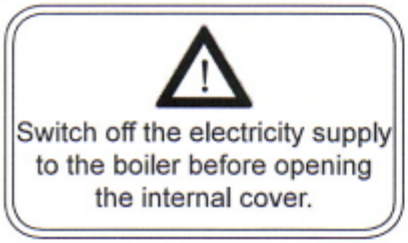


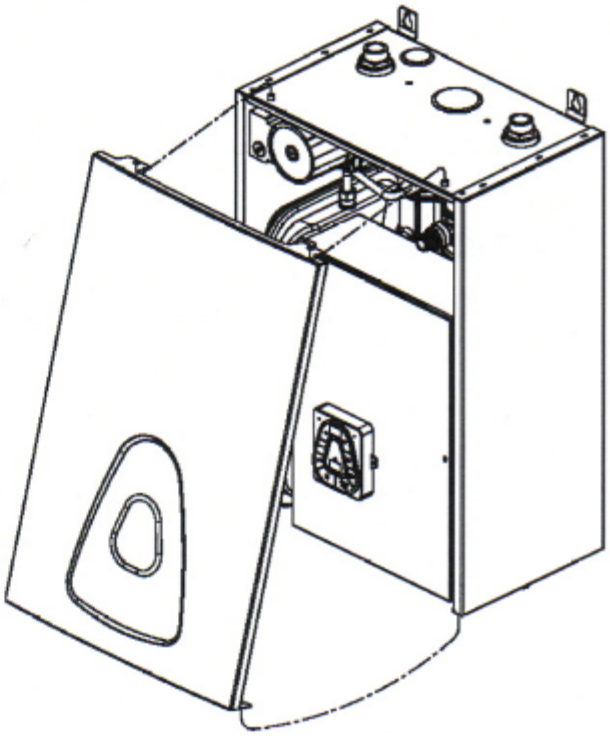
D = Heating supply 1» female nut (26/34)
R = Heating return 1» female nut (26/34)

2.4 - Preparation

2.4.1 - Opening the case

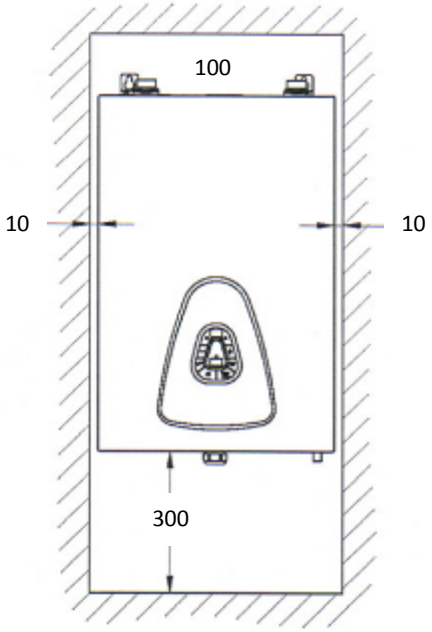
The boiler is opened by unscrewing the bottom two bolts a couple of turns (they do not need to be completely removed). The front cover is then pulled away from the bottom and lifted off the two pins at the top of the casing.





2.4.2 - Location

- The boiler must be located at least 300mm above any object to allow the elements to be removed. At least 100mm is required at the top of the boiler to allow for connection of pipework.
- 10mm is required at the sides of the unit.
- The boiler must be mounted on an internal solid masonry wall capable of withstanding the weight of the product when full of water.
- Consideration should be given to the routing of electric cables to the product and the wiring to a thermostat (if used).
- The location must be free from frost and excessive moisture.



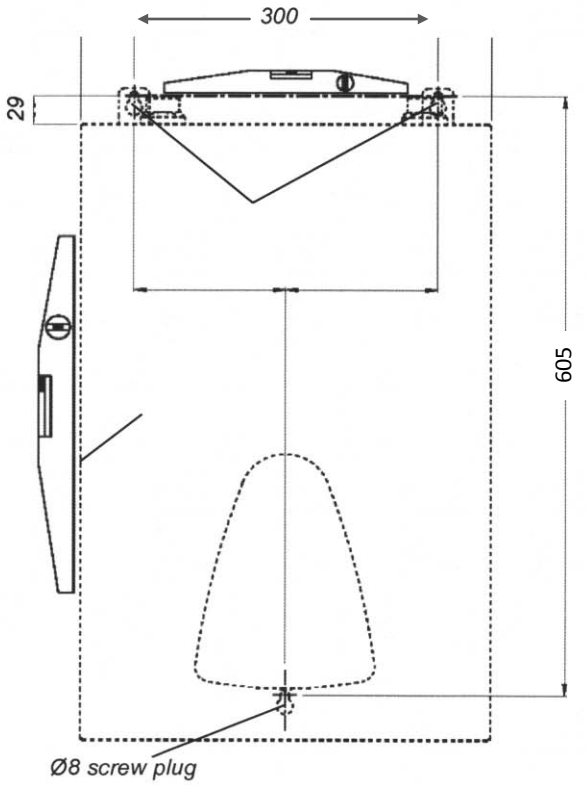
2.4.3 - Installation

- Once the location of the boiler has been selected, mark the hole positions. Use a spirit level to ensure the holes are aligned correctly. Access to the bottom screw hole is achieved by removing the bottom element plate.

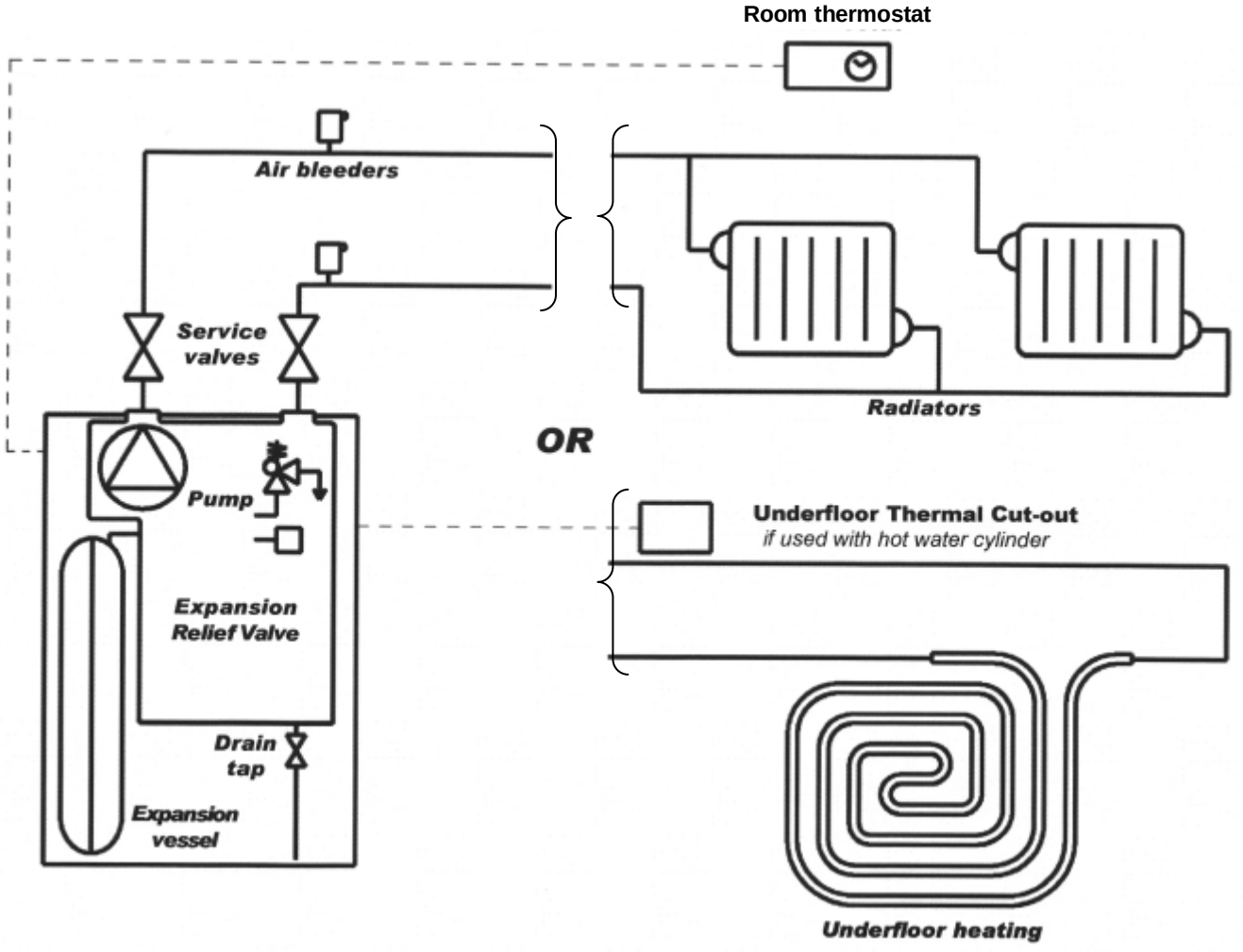
- Once marked out, drill 8mm diameter holes and plug with masonry plugs. Screw in high strength screws to a depth that allows the inner face of the screw head to protrude from the wall a distance to allow the mounting plates at the rear of the boiler to engage (approx 5mm).

- With suitable equipment or an assistant raise the boiler to the fixing point and ensure each screw has engaged into the mounting slots. Tighten the screws to secure the boiler to the wall.

- Once fixed to the wall the boiler may be plumbed into the central heating system.



2.5 - Plumbing

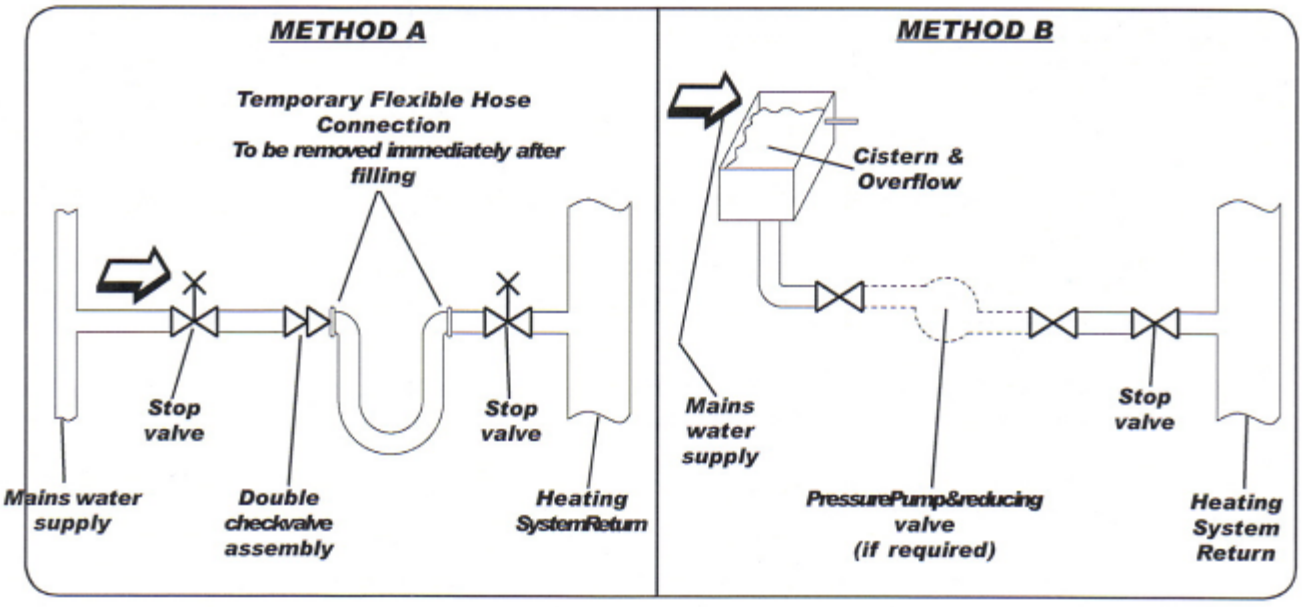


- Install the heating system to bring the flow and returns to the intended boiler location.
- The system must be flushed prior to finally connecting the boiler, in order to remove any debris from the pipework. Do not use the fitted pressure relief valve to flush the system as particles may get trapped in the valve and cause incorrect operation.
- At least one air bleed device should be installed at the highest point of the heating system to remove trapped air and ensure the silent running of the system
- If using radiators with Thermostatic Valves, a bypass radiator must be installed with lock-shield valves that will allow a flow of 350 litres per hour
- Service valves should be fitted to both the inlet and outlet of the boiler for ease of maintenance.
- Although the boiler is capable of operating **without** a room thermostat, this is required for automatic adjustment of the boiler output temperature.
- Where under-floor heating is being used without a hot water cylinder, the 60°C thermal cut-out must be connected in place of the factory selected 100°C item - **See Section 2.6.1**
- A drain cock should be fitted to the lowest part of the heating system to allow the system fluid to be drained fully.
- The boiler incorporates an 8 litre expansion vessel which is suitable for heating systems as follows:

Initial System Pressure (bar)	0,50	0,75	1,00	1,50
Total Water in heating system (litres)	96	84	73	50
For larger systems Multiply the volume of water by these factors	0,0833	0,0930	0,1090	0,1560

This boiler is not fitted with a filling loop. Any filling loop being fitted should comply with the water supply (water fittings) regulations 1999 Section G24.1 and G24.2. A filling loop should be fitted at some point to allow the CH system to be filled.

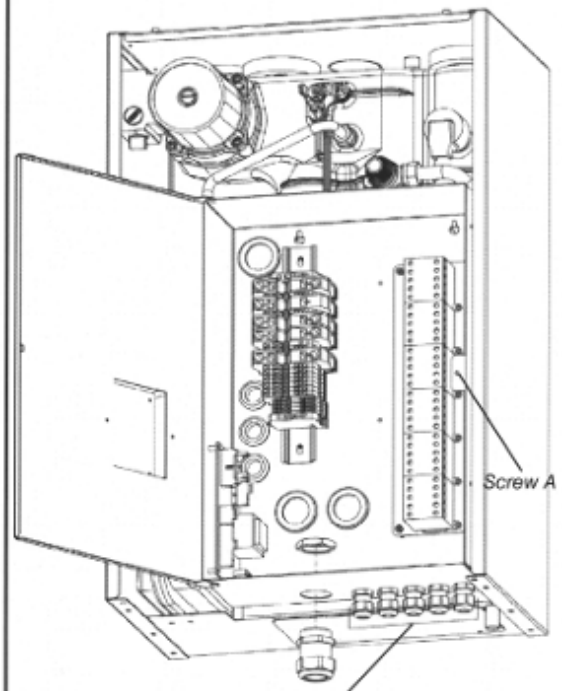
Two types are shown below:



2.6 - Electrical

Electrical connections may become loosened during transportation.
To avoid any risk, carefully check all electrical terminals for security and tightness.

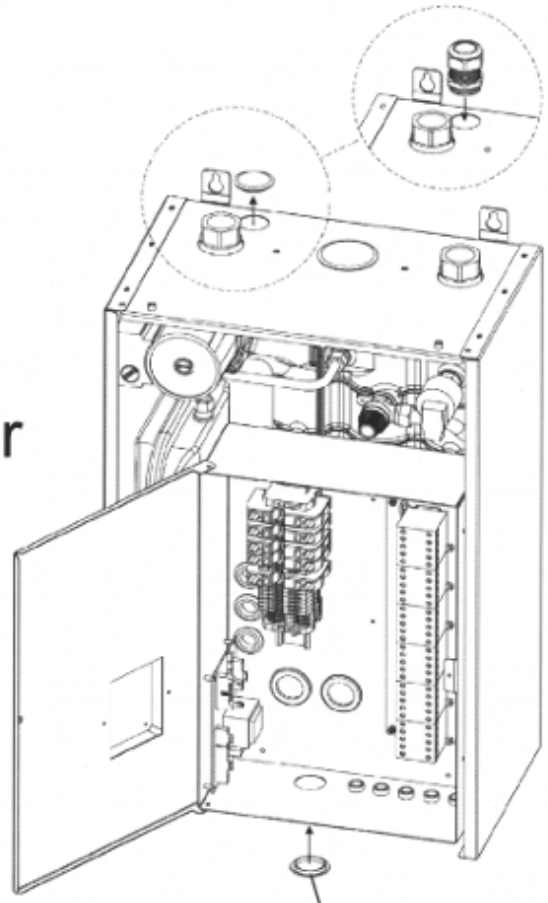
Fit the gland nut (supplied with the boiler) for connection to mains in the bottom of the casing.



5 gland nuts for accessories connections (Room thermostat, outside and/or Domestic Hot Water sensor and remote cut-out)

or

Move the gland nut (supplied with the boiler) for connection to mains from the bottom of the casing to the top. Remove the blanking cap and close the hole below casing using same.



Plastic cap moved from top to bottom

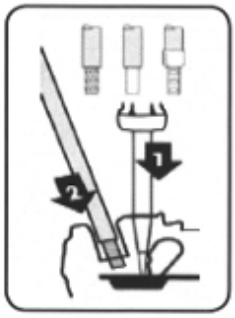
Connections are cage-clamp terminals, to be used as follows :

- For accessories terminals use a 3,5 x 0,5mm blade screwdriver
- For power terminal use a5,5 x 0,8mm blade screwdriver.

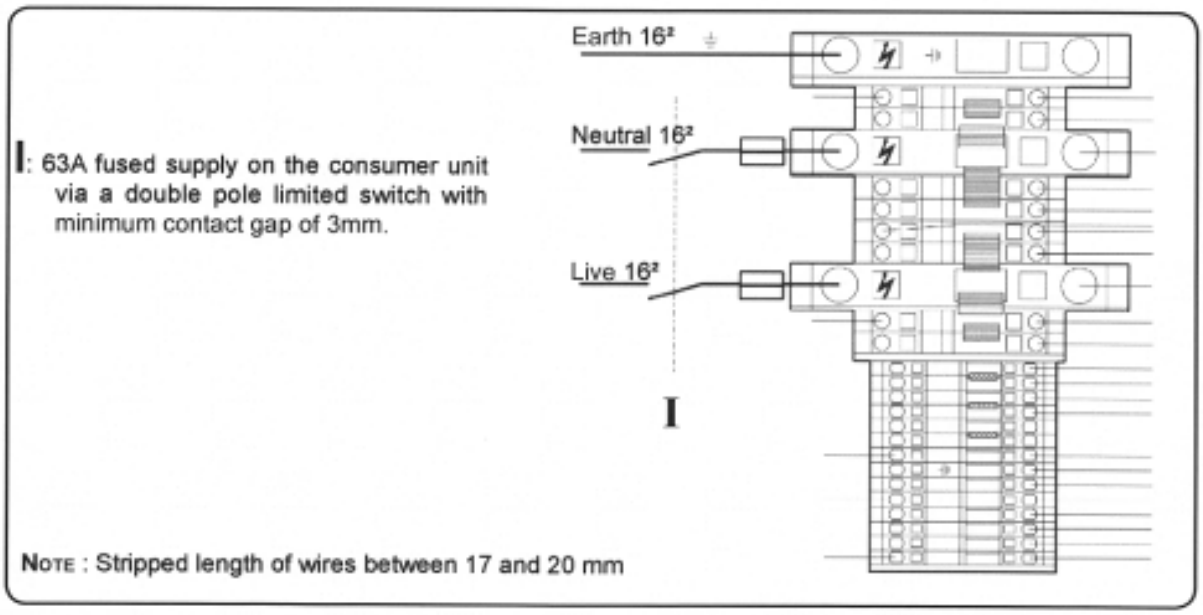
1 : Introduce the blade of the driver into the opening located just above or below the mark.

2 : Introduce the connector's terminal inside the cage.

3 : Remove the screwdriver



Note : Stripped length of wires must be :
- within 10 and 12 mm for control terminals in $2,5^2$
- within 17 and 20 mm for main power terminals



1 Wiring external to the appliance must be in accordance with the current I.E.E Wiring Regulations (BS 7671) for electrical installations plus any local regulations which may apply.

2 This appliance must be earthed

3 The terminal blocks are fitted with cage-clamp electrical connectors. These are operated using a 2.5mm x 0.4mm blade screwdriver for the accessory terminals and a 3.5 x 0.5mm blade screwdriver for power terminals.

4 The boiler should be permanently connected to the electricity supply, direct from a 63A fused supply on the consumer unit via a double pole linked switch with a minimum contact gap of 3mm. No other appliances should be powered from this supply.

5 The minimum cable size for connection to the main power supply is 3 x 16mm^2 (see above)

6 To connect a wire, insert the blade of the screwdriver into the opening just above the central mark of the terminal block and pivot the blade toward the centre. Insert the wire into the cage and remove the screwdriver blade. Ensure the wire is firmly gripped by the connector.

7 The **no-voltage** connections of a room thermostat may be connected to terminals # 1 (common contact) & # 2 (normally open contact) of the boiler (check compatibility with the thermostat manufacturer's installation instructions) routing the cable through the smaller cable entry points. **See section 2.6.3.2**

8 If using a non-programmable room thermostat, it is recommended that the **no-voltage** switched contacts of a separate timer/programmer be connected in series with the room thermostat to terminal # 2 of the boiler. **WARNING - a switched live must not be connected to this terminal.**

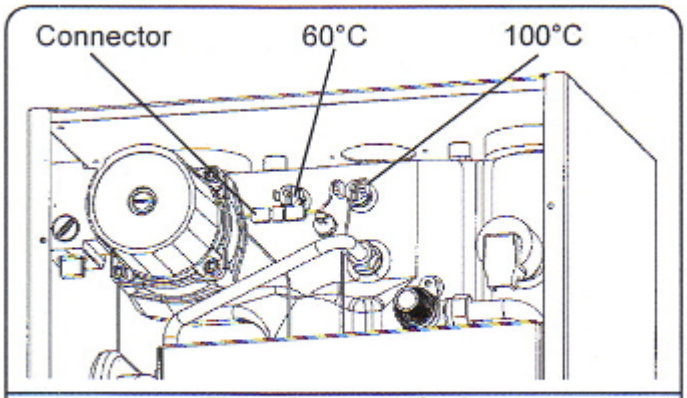
9 If used, the cylinder thermostat normally open contact (240v) should be connected to terminal # 25
See section 2.6.3.2

10 Do not switch on the electricity supply until asked to do so in the commissioning & Testing Section.

11 As a minimum, it is recommended that a room thermostat be installed to control the appliance. Thermostatic radiator valves may be fitted in the system however they must not be fitted in the room where the room thermostat is fitted. There must be at least one radiator installed with lock-shield valves that should not be closed and will allow 350 litres per hour circulation. Further guidance can be found in the Domestic Heating & Hot Water Guide to the building regulations.

2.6.1 - Selecting Thermal Cut-Out

The thermal cut-outs are situated at the top of the boiler and may be selected during the installation by re-routing the electrical connections. The boiler is factory set with the 100°C cut-out selected for use with a radiator heating system. If the boiler is to be used with under-floor heating, remove the connectors from the 100°C cut-out and connect them to the 60°C cut-out ensuring that a good connection is made.

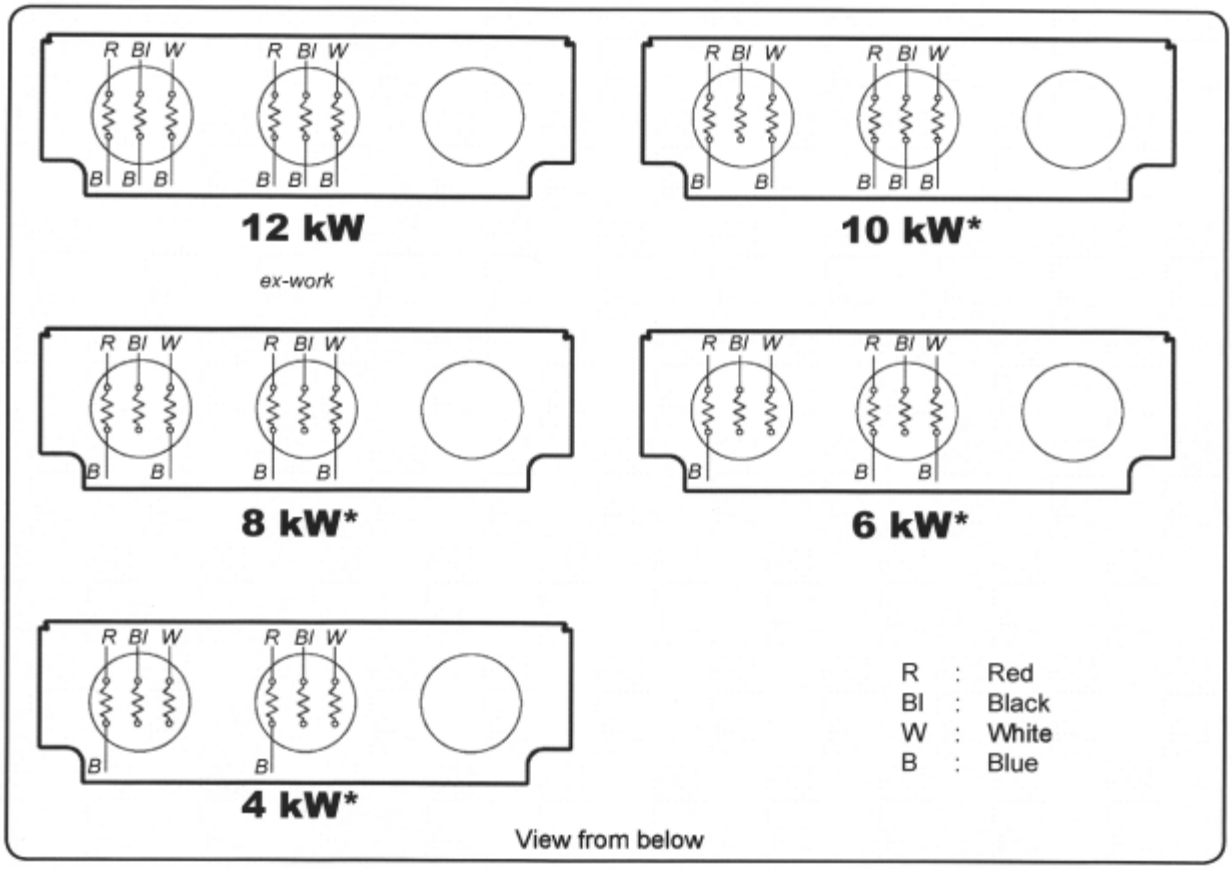


Thermal cut-out selection
(100°C for radiators, 60°C for underfloor)

Where **both** under-floor heating and a hot water cylinder are used, it will be necessary to use the 100°C cut-out in the boiler and include a separate 60°C cut-out for the under-floor heating circuit.

2.6.2 - Power Selection

The boiler is supplied as a 12kW modulating boiler but can be reduced to 10, 8, 6 or 4kW by disconnecting individual elements as detailed below.

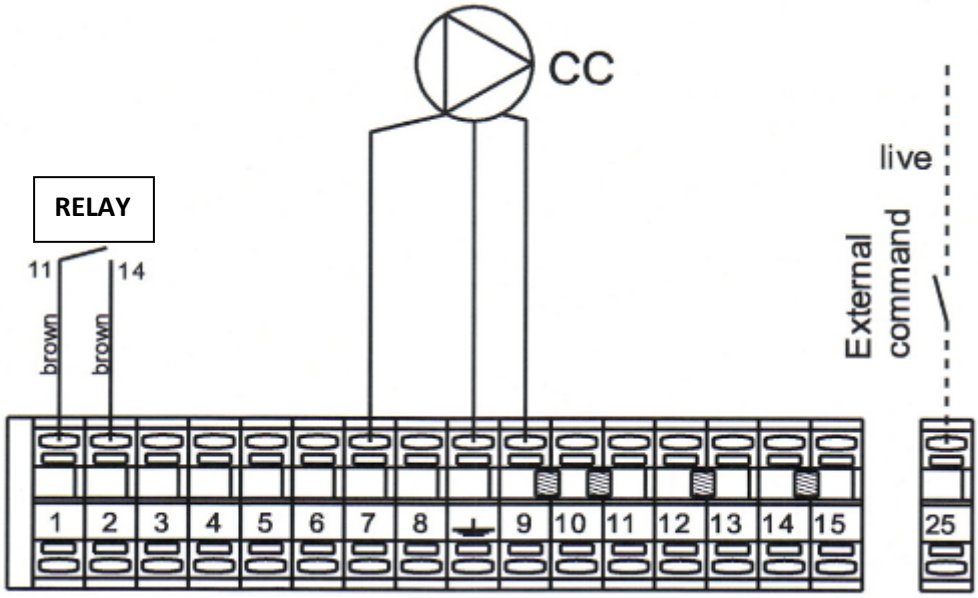


* Remove blue connectors between power terminal and elements according to drawing.

NOTE - Cross refer to **Section 2.16** for programming details associated with the above

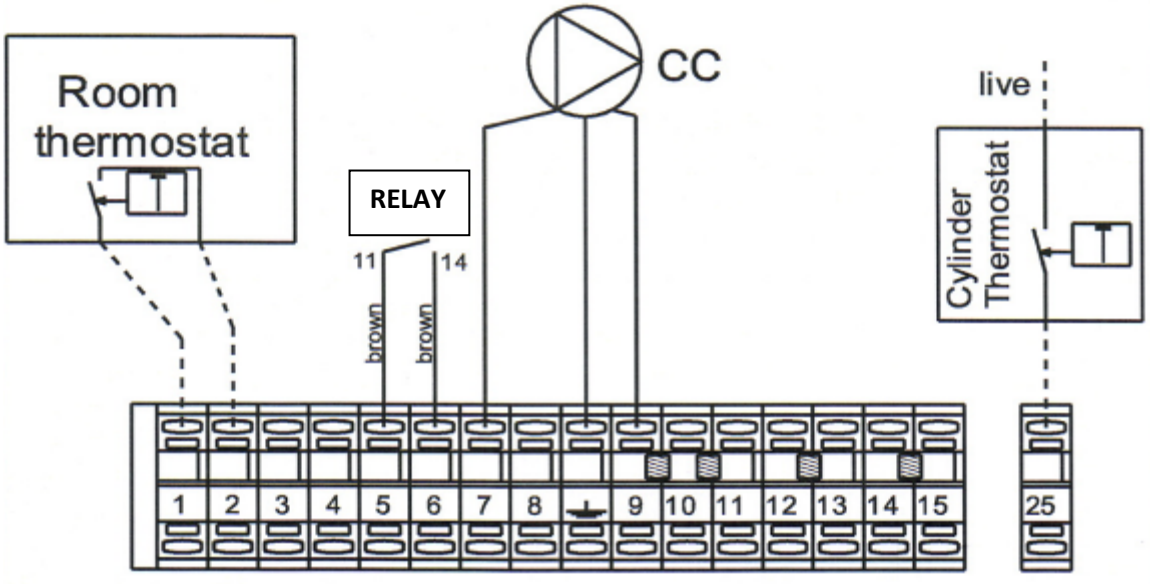
2.6.3 - Control Accessories Wiring

2.6.3.1 - Operating from a switched live



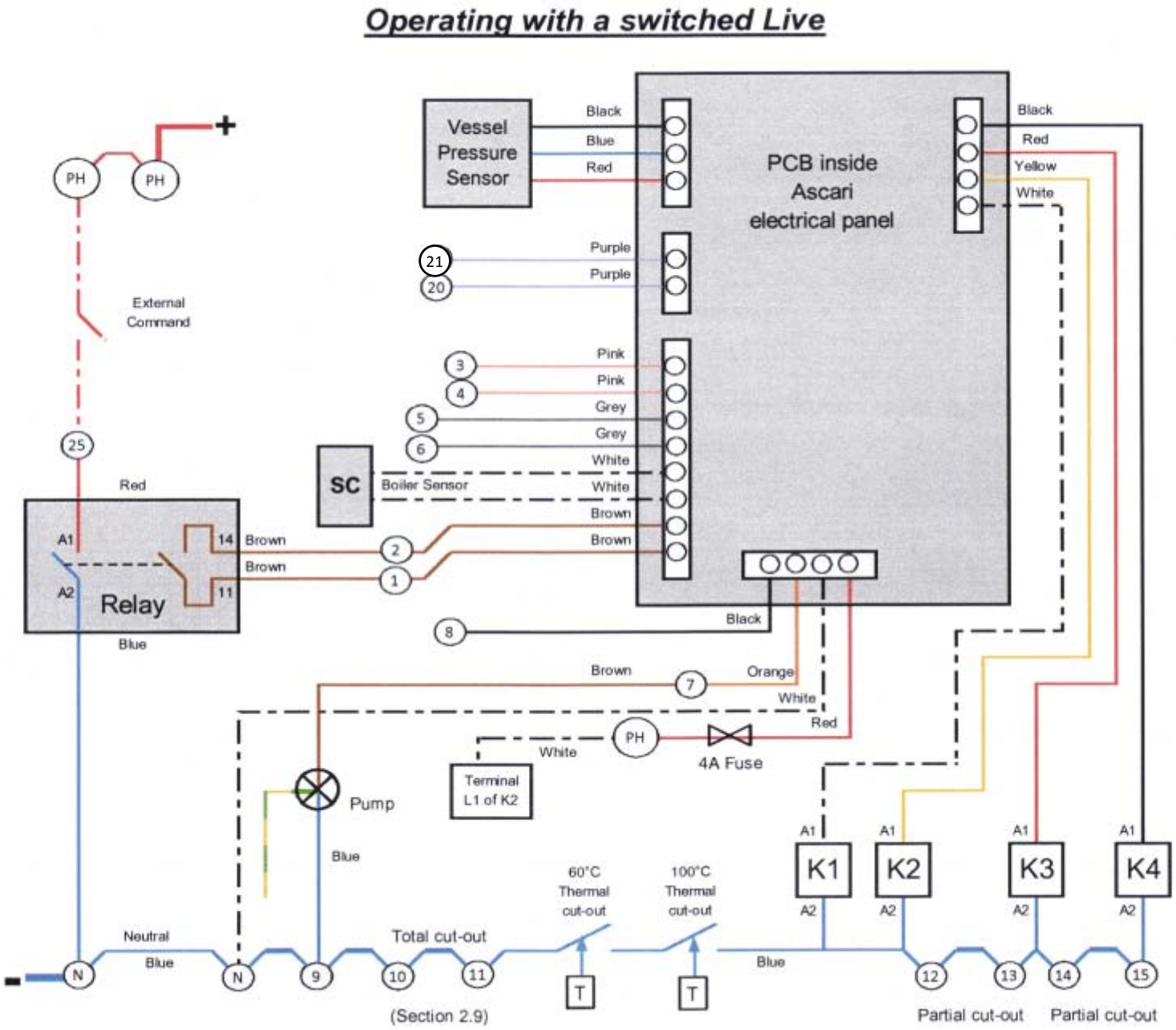
- Terminals # 1 & # 2 are wires from terminals # 11 & # 14 of relay in electrical box
- CC = 3 speed pump
- Terminal # 25 - external command of switched live (use live 240v common to the boiler on any contactor pin L1 - **See also circuit diagram 2.7.1)**
- Connectors should be clean and bright to ensure a good connection
- Cross section of connectors should be between 0.5 & 1mm^2

2.6.3.2 - Operating from a room thermostat and direct cylinder thermostat

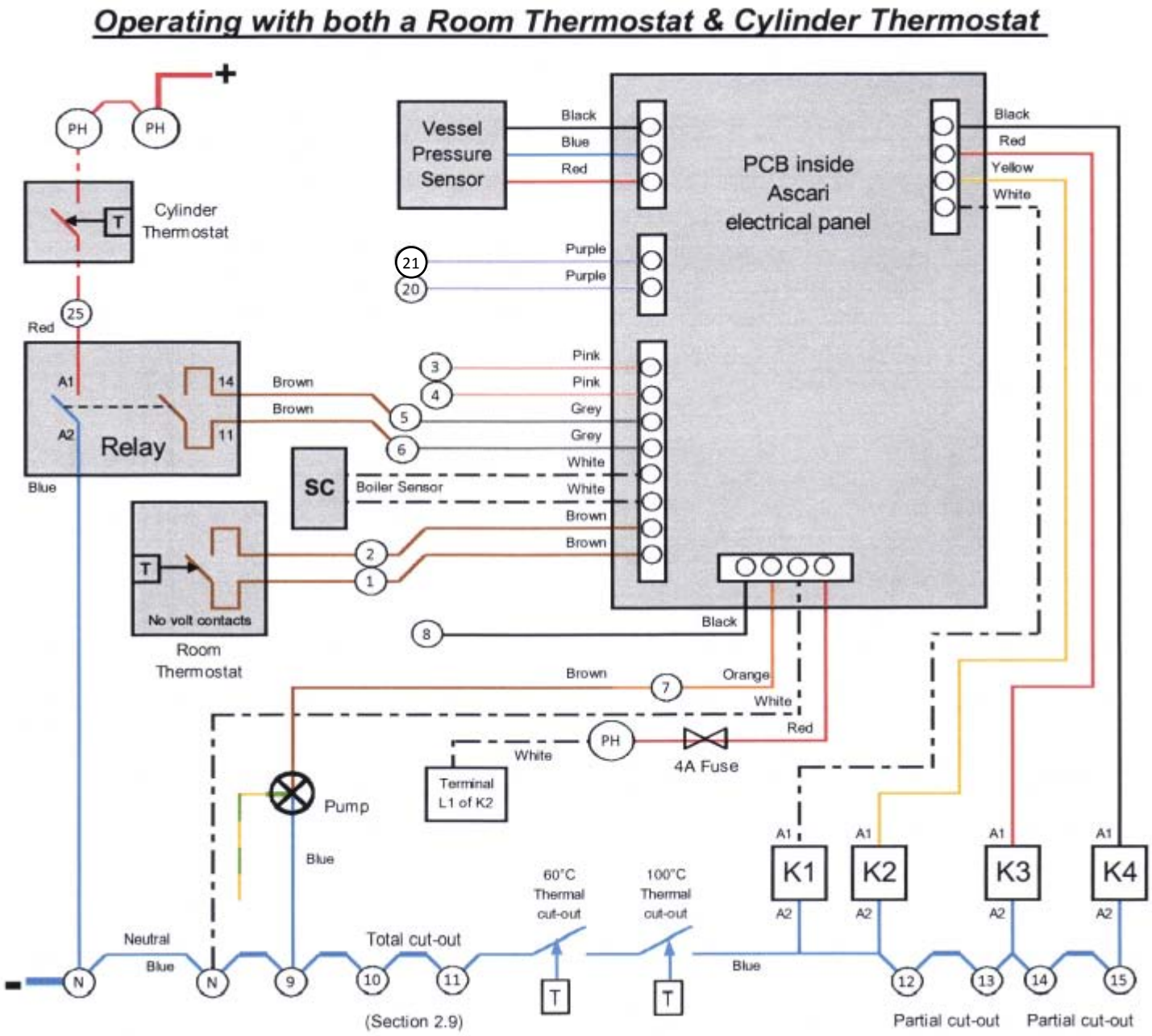


- Terminals # 1 & # 2 - no voltage contacts of room thermostat
- Terminals # 5 & # 6 - wires taken from terminals # 1 & # 2 to be placed in terminals # 5 & # 6 respectively
- CC = 3 speed pump
- Terminal # 25 - external command of direct cylinder thermostat (use live 240v common to the boiler on any contactor pin L1 - **See also circuit diagram 2.7.2**)
- Connectors should be clean and bright to ensure a good connection
- Cross section of connectors should be between 0.5 & 1mm^2

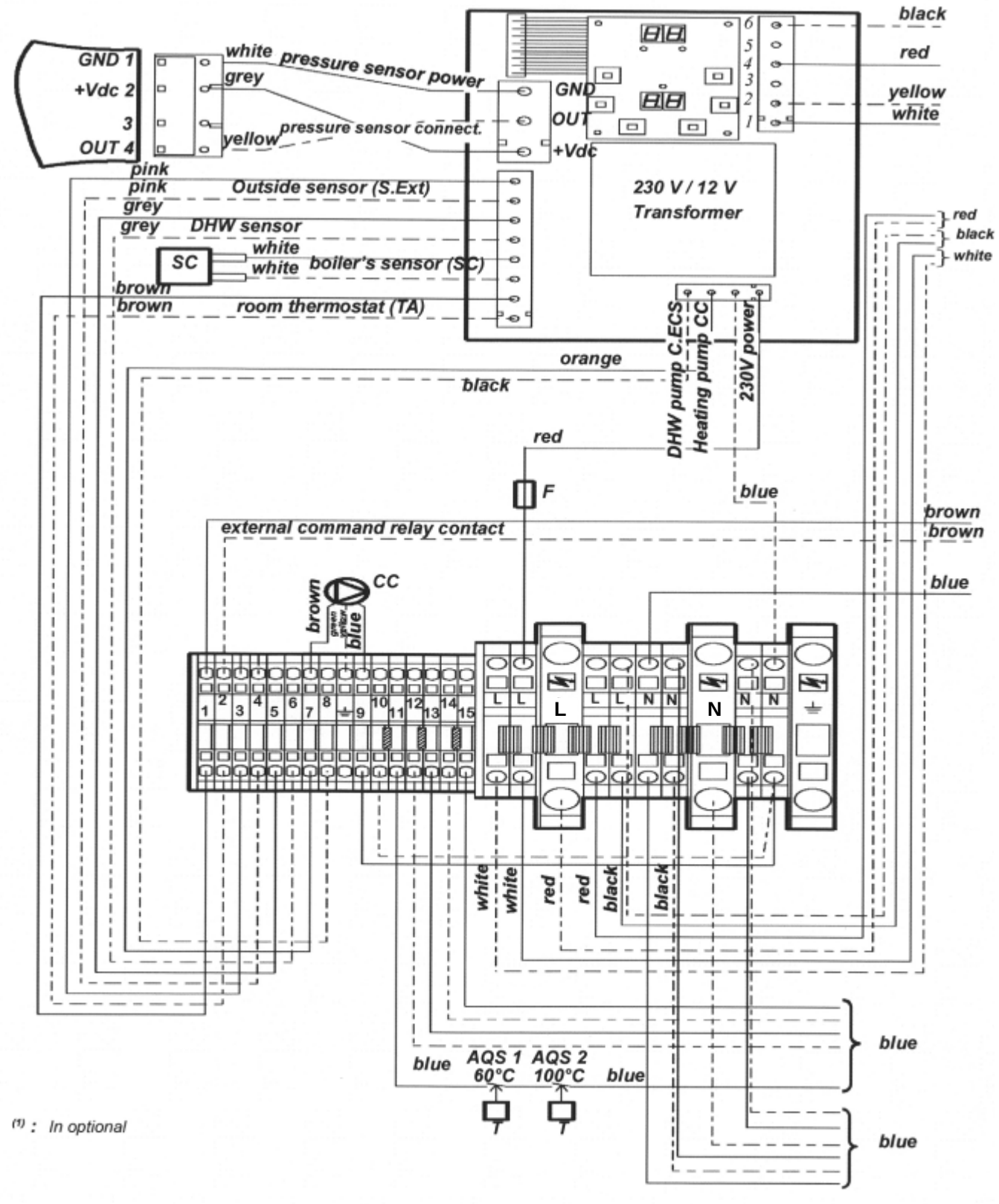
2.7.1 - Wiring Diagrams



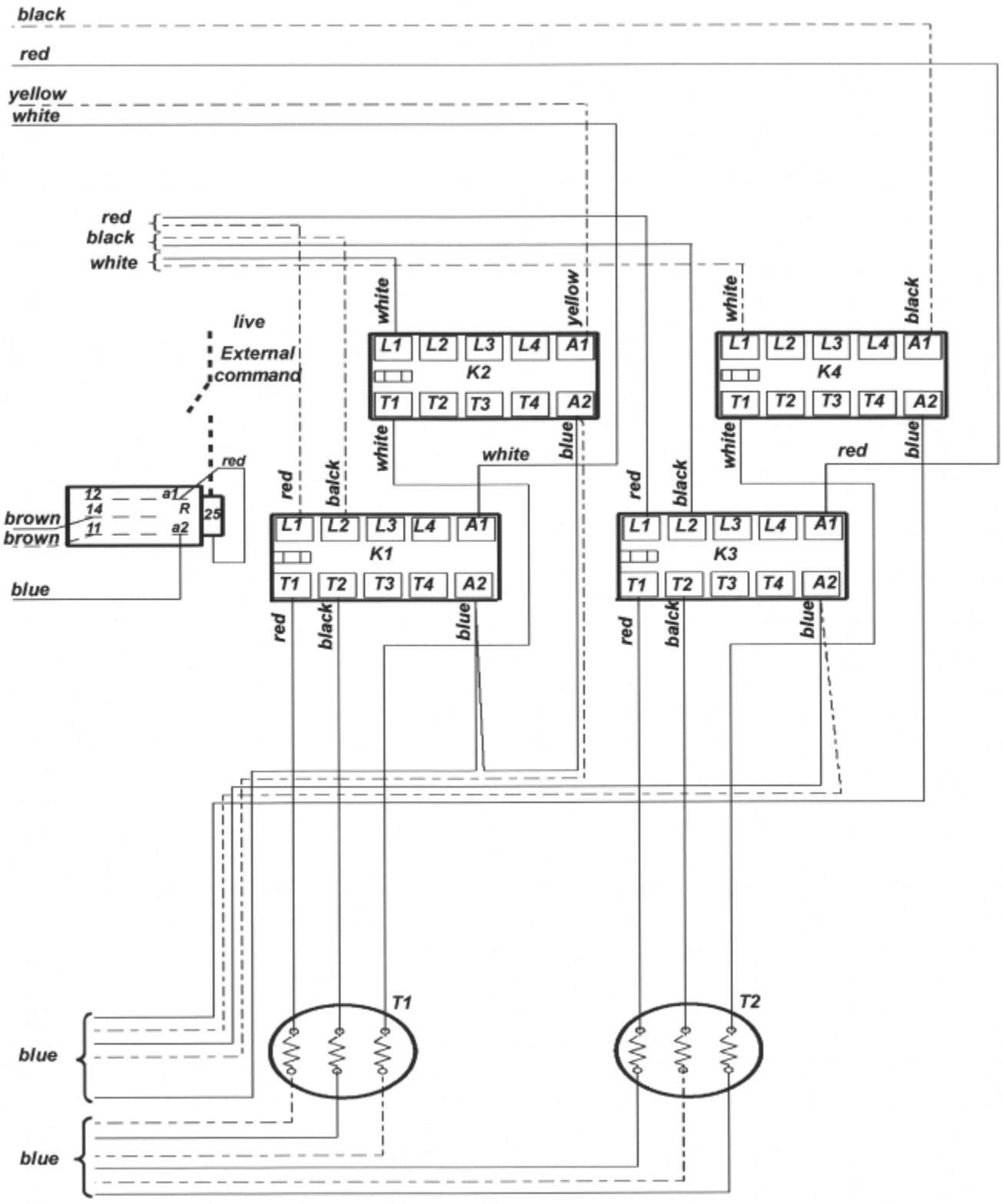
2.7.2 - Wiring Diagrams



2.7.3 - Generic Wiring Diagrams



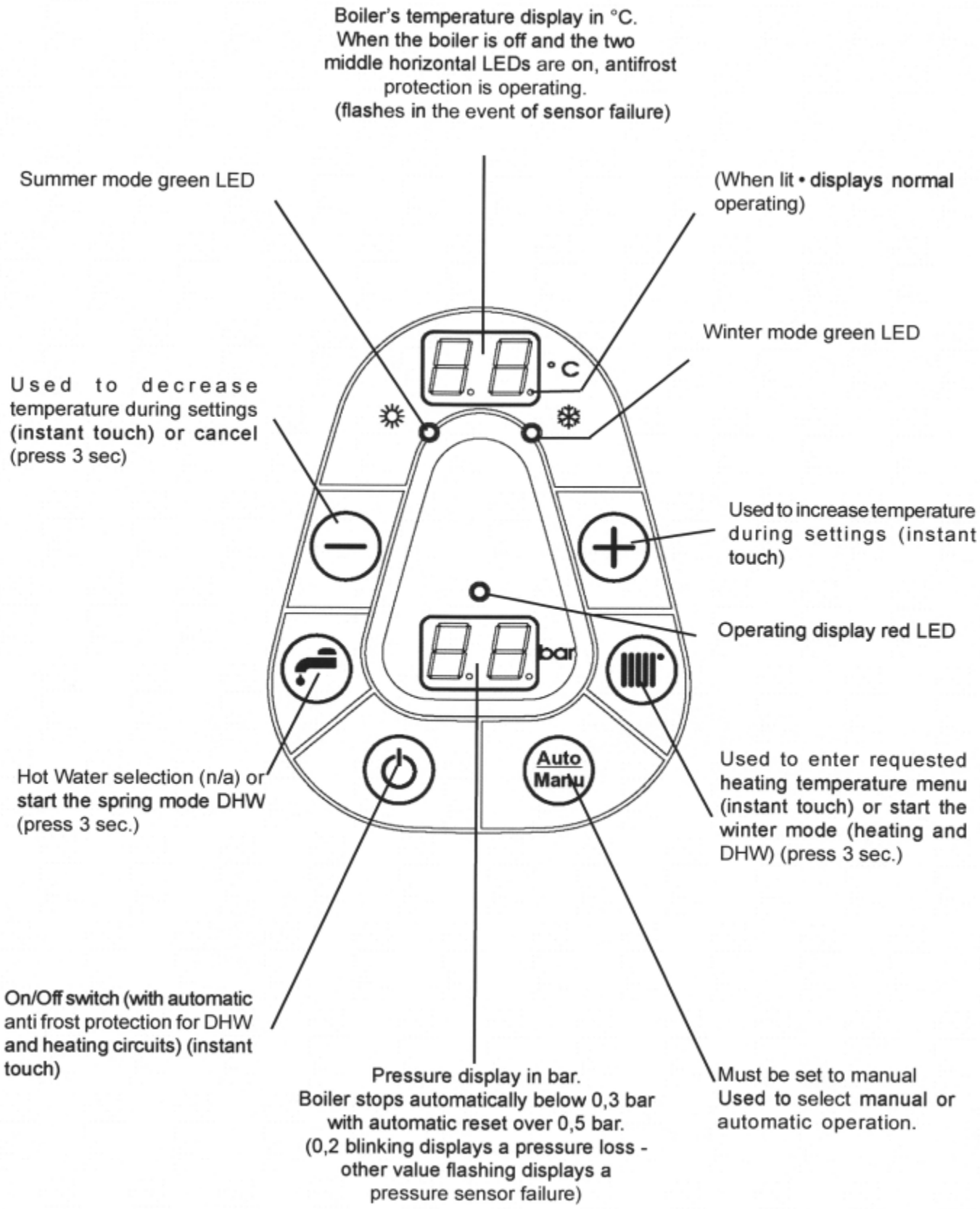
Key :					
L	:	Live	CC	:	3-speed pump
N	:	Neutral	DHW sensor	:	Domestic Hot Water Safety limitor
F	:	4A fuse size 5 x 20	SC	:	Boiler's sensor
C1	:	Electronic card with display			



Key :

AQS1	:	60°C Thermal Cut-out with Manual reset	K1 to K4 :	20A power breakers
AQS2	:	100°C Thermal Cut-out with manual reset	T1 & T2 :	6kW heating elements

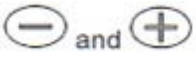
2.8 - Control Panel Description



2.9 - Commissioning & Testing

- Check that the pressure of the expansion vessel is at its factory setting of 1bar (0.1 MPa)
- The heating system should be filled using the approved installed filling loop. Ensure all radiator valves are open. The initial cold system pressure should be between 1.0 (0.1 MPa) and 1.5bar (0.15 MPa).
- Once filled, check the system for leaks
- Open the drain cock and drain the system fully (this will help flush away any remnants of debris)
- Refill the system (ensuring that the correct ratio of corrosion inhibitor has been added) to a pressure between 1.0 (0.1 MPa) and 1.5bar (0.15 MPa) and manually operate the pressure relief valve to check that water runs away correctly and the valve closes properly.
- If no external pressure gauge is available, it is possible to check the system pressure as follows:
    - With the main electricity supply 'OFF' remove the bridge between terminals # 10 & # 11 to isolate the heating elements and prevent them being energised
    - Turn the main electricity supply 'ON'. Turn 'ON' power to the boiler using the button on the front panel and fill the boiler using the pressure gauge on the front display panel to monitor & set the cold system pressure
    - Once set at 1 to 1.5bar, turn 'OFF' the power to the boiler and the main electricity supply and refit the bridge to its original position between terminals # 10 & # 11
- Turn main electrical power 'ON' and, with the boiler in stand-by mode (two horizontal LED's in the upper section of the display panel), start a forced circulation to assist air bleeding of the installation by pressing the radiator symbol key  . This is automatic and will run for two (2) minutes.
- When finished, turn main electrical supply 'OFF'
- Ensure the system is at the pressure detailed above and if so, disconnect from the filling loop.
- Ensure that all covers have been replaced. Turn main electrical supply 'ON' and allow unit to carry out a self diagnosis. Refer to **Section 2.20** if a fault code is displayed.

2.10 - Boiler Configuration

- Once the boiler has initialised, the feature options can be selected.
- Press both  on the front panel together for 3 seconds to enter the selection menu.
- The upper section of the display should show  flashing
- Use the  key to cycle through the various parameters from # 2 to # 23 (listed in **Section 2.10.1**)
- Use the  key to select a particular parameter for change
- The parameter value begins flashing on the lower section of the display
- Use the  keys to change the setting as required.
- Press the  key to confirm the setting and return to the menu
- Press both  on the front panel together at any time to exit the menu

2.10.1- Boiler Configuration Parameter Listing (read in conjunction with Section 2.10.2)

Condition	Parameter #	Description	Available settings	Ex-work settings
Manufacturer	01	Output level number	2 ; 3 ; 4 ; 5 or 6	Depending to the boiler Output
	02 (1)	Maximum requested boiler's temperature (MAXBT)	21 to 80°C	75°C
	03 (1)	Minimum requested boiler's temperature (MINBT)	21 to MAXBT °C	50°C
	04	Room thermostat connected (no = 0 ; thermostat = 1 ; sensor = 2)	0 ; 1 or 2	1
If 04 = 1 or 2	05	Heating circuit pump monitored by room thermostat (no = O ; yes = 1)	0 or 1	1
if 04 = 1 or 2	06	Autoadaptability or automatic correction of the heating diagram or the requested temperature (no = O ; yes = 1)	0 or 1 (2)	1
	07	Outside sensor (no = O ; yes = 1)	0 or 1	0 mandatory
if 07 = 1	08 (1)	Maximum outside temperature (MAXOT)	11 to 25°C	20°C
if 07 = 1	09 (1)	Minimum outside temperature (MINOT)	-30 to +10°C	-5°C
if 07 = 1	10	Automatic summer switch (no = O ; yes = 1)	0 or 1	0
	11	Postponement between 2 steps activation and desactivation	1 to 6 min (3)	2 min.
	12	Domestic Hot Water production (no = 0 ; yes = 1)	0 or 1	0
if 12 = 1	13	Domestic Hot Water probe (no = 0 ; yes = 1)	0 or 1 (4)	0 mandatory
if 13 = 1	14	Legionnaires disease free mode (no = 0 ; yes = 1)	0 or 1 (5)	0
If 01 = 4 or 6	15	Power levels peering	0 or 1	0 mandatory
	16	Connection of 6 power steps (no = 0 ; yes = 1)	0 or 1	1
if 16 = 0	17	Connection of power step 1 (no = 0 ; yes = 1)	0 or 1	1
if 16 = 0	18	Connection of power step 2 (no = 0 ; yes = 1)	0 or 1	1
if 16 = 0	19	Connection of power step 3 (no = 0 ; yes = 1)	0 or 1	1
if 16 = 0	20	Connection of power step 4 (no = 0 ; yes = 1)	0 or 1	1
if 16 = 0	21	Connection of power step 5 (no = 0 ; yes = 1)	0 or 1	1
if 16 = 0	22	Connection of power step 6 (no = 0 ; yes = 1)	0 or 1	1
	23	Timer input allocation (no = 0 ; Lowering of Eco boiler requested temperature = 1 ; Lowering of frost protection boiler requested temperature = 2 DHW autorisation = 3)	0 ; 1 ; 2 or 3	0 mandatory
Manufacturer	24	Water pressure sensor	0 or 1	1

(1) : See § 7 to set the heating diagram according to 4 paremeters (MAXBT, MINBT, MAXOT and MINOT)

(2) : Prohibited when using a scheduled external command

(3) : Depending on water flow rate and volume inside the heating circuit, the boiler might start at very short intervals with wear and tear resulting. To reduce the number of cycles, increase postponement.

NOTE : To reset autoadaptability, zero parameter # 06, then set value to 1.

(5) : **With this mode selected, the Domestic Hot Water temp will increase to 65°C. A thermostatic mixer valve should be fitted to avoid scalding.**

2.10.2 - Boiler Configuration - continued

Parameter	
02	Selects the maximum temperature of the water circulating in the heating circuit.
03	Selects the minimum temperature of the water circulating in the heating circuit.
04	Select '01' if operating from a switched live or if a room thermostat is installed and connected Do **not** select '02'.
05	If parameter # 4 above has been set to '01', this should also be set to '01'
06	If parameter # 4 above has been set to '01', the boiler can automatically adjust the water temperature in the heating circuit according to the warm-up times of the property, over-riding the max & min temperature settings. If this facility is required, select '01'. If not, leave at '0'
07	Should be set to '0'
08	n/a
09	n/a
10	n/a
11	The boiler can delay the switching on / off of the elements to provide a smooth power gradient and also reduce the number of cycles occurring in a short period of time. The delay can be set between 1 and 6 minutes (default 2 minutes)
12	Should always be at '0'
13	Should always be at '0'
14	n/a
15	Should always be at '0'
16	Should always be at '1'
17 to 22	n/a
23	Should always be at '0'

2.11 - Automatic / Manual Operation

NOTE that Automatic operation is only available if an outside temperature sensor is fitted and parameter # 7 is selected to '01'. This sensor is not available in the United Kingdom.

The boiler must be set to manual operation as follows:

- Press and hold the Auto/Man button - the display will show either **Au** or **Man**
- Press the button again to toggle the display until it shows **Man**
- Press and hold the Auto/Man button for 3 seconds to return to normal mode.

2.12 - Temperature Display

During normal operation, the boilers temperature is displayed on the front panel in front of '°C' e.g. 

Pressing the  key once, displays  in front of °C with a code of '00' or '01' beneath.

- '00' denotes no demand for heat from either the thermostat or the boiler
- '01' denotes a demand for heat from either the thermostat or the boiler

Continued overleaf

Pressing the ⊕ key a second time displays CC in front of °C with the boilers temperature setting displayed beneath (See **Section 2.13** to adjust this setting)

The following additional displays are available dependant on parameter settings.

Display	Value Beneath	Description	Availability	Note
Au	03	Heating Diagram Correction	If parameter # 6 @ '01'	In °C. If the small light to the right of the value is 'On', the value is negative
SE	03	Outside Air Temperature	If parameter # 7 @ '01' (N/A in the UK)	In °C. If the small light to the right of the value is 'On', the value is negative
Hr	00 01	Timer Input	If a timer is connected & parameter # 23 selected	'00' denotes timer opened '01' denotes timer closed
SS	60	Domestic Hot Water Probe temperature	If parameter # 12 @ '01' & parameter # 13 @ '01'	Value in °C
ES	00 01	Domestic Hot Water Sensor status	As above	'00' denotes no demand '01' denotes a demand

2.13 - Requested Heating Temperature in Manual Mode

Press the symbol to display the requested temperature (flashing in front of °C)

Press ⊖ or ⊕ to increase or decrease the requested temperature to a level between MINBT and MAXBT (see parameters # 2 & # 3 of the boiler configuration listing - **Section 2.10.1**)

Press the symbol to confirm the setting and return to normal display

2.14 - Frost protection

When the upper display on the front panel shows two horizontal LED's -- in front of °C, the boiler is switched 'OFF', connected to the power supply and Frost Protection is active.

The boiler will start automatically when the boiler's temperature or the domestic hot water temperature falls below 5°C. When the water temperature reaches 35°C, the boiler switches 'OFF'

2.15 - Summer / Winter Shift (only available in Manual Mode)

Press the symbol for 3 seconds to start the Summertime Mode (sunlight LED lit)

Press the symbol for 3 seconds to start the Wintertime Mode (snowflake LED lit)

2.16 - Programming the Maximum Output Setting of the Boiler

The boiler is delivered with a maximum output of 12kW (parameter # 16 selected to '01'

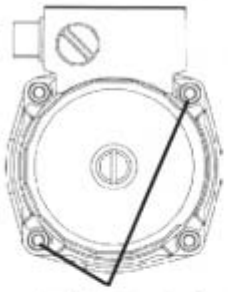
If it is necessary to reduce the output, set parameter # 16 to '00' and parameters # 17 to # 22 as follows:

Power Stage #		1	2	3	4	5	6
Power Stage Value		4 kW	2 kW	0 kW	4 kW	0 kW	2 kW
Parameter N°		17	18	19	20	21	22
Parameter value to obtain the requested max output (0 = no, 1 = yes)	12 kW	1	1	0	1	0	1
	10 kW	1	0	0	1	0	1
	8 kW	1	0	0	1	0	0
	6 kW	1	0	0	0	0	1
	4 kW	0	1	0	0	0	1

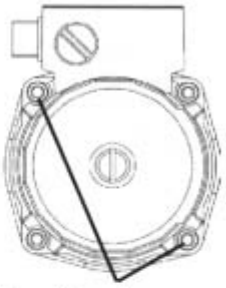
2.17 - Pump Speed

The boiler is factory set at pump speed # 3. For lower speeds, the selector on the lower face of the electrical connection box on the pump may be turned to # 1 or # 2.

If the pump produces an abnormal noise, slacken the cover screws (without creating leaks), then retighten following the instructions below.

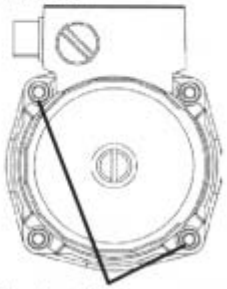


1 - Tighten the two screws above to a torque of 3Nm.



2 - Tighten the other two screws to a torque of 3 Nm

3 - Tighten the first two screws to a torque of 5 Nm.



4 - Tighten the last two screws to a torque of 5 Nm.

2.18 - Maintenance

Shortly after Installation - turn 'OFF' electrical supply to the boiler and re-check the tightness of all electrical connections of the power supply and the elements

Monthly - check the pressure in the heating circuit (minimum 1 bar when cold)

Annually - Redring Xpelair Group recommend that the boiler be checked by a qualified Technician.

2.19 - Overheating & Replacement of Heating Elements

Under-floor Heating

- In the case of overheating, the 60°C thermal cut-out will cut power to the heating elements

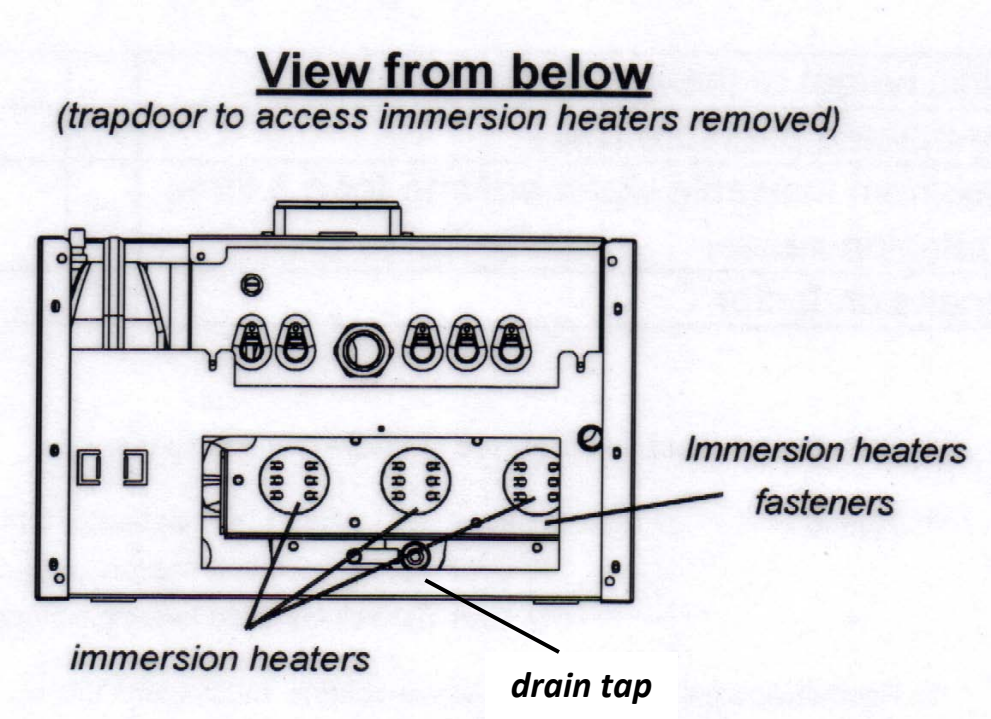
Radiators

- The 100°C thermal cut-out will also cut power to the heating elements

After solving the cause of any overheat issue, reset the thermal cut-out by pressing the red button in the centre of the sensor's head.

A lack of power or performance **may** be due to a defective heating element. To change an element:

- Turn 'OFF' the main electrical power supply
- Remove the lower access panel
- Isolate the boiler from the system (if possible) then drain using the drain tap
- Electrically disconnect the elements making a clear note of which wire goes where
- Remove the element retaining plate and withdraw / replace the defective element
- Re-assemble and refill in the reverse order to the above ensuring that the correct ratio of corrosion inhibitor is added to the water



2.20 - Troubleshooting & Failures Display

The boiler has numerous selectable options. Please ensure that the correct selections are made for the type of installation you have made.

Note that if you have selected the use of a room thermostat or hot water cylinder, the boiler will not operate until these devices are connected.

In the event of a component failure, the display will flash  in front of °C and a code in front of 'bar'

'00' - Pressure Sensor
'01' - Boiler Sensor
'02' - Outside Sensor
'03' - Domestic Hot Water Sensor

Please turn the boiler 'OFF' and call the Redring Xpelair Group Customer Service Department - see Servicing Section.

If the number in front of 'bar' starts flashing with a low value (e.g. ). it indicates that the system pressure has fallen below the minimum operating pressure.

- Check to see if water has discharged from the pressure relief valve - if so, call the Redring Xpelair Group Customer Service Department
- Check for leaks from the system

Once the fault has been cleared, the boiler will turn 'ON' again if the system is filled and pressurised to over 0.5bar.

Problem	Probable Cause	Action
The boiler is not operating The red LED is illuminated	The 60°C Thermal cut-out has tripped	Is the boiler set for Under-floor Heating? This TCO should <u>not</u> be used for radiator systems. Check the boiler settings Check the water circulation • Open all cocks • Clear sludge from the circuit • Check pump operation Press the red button on the Thermal Cut-out until a click is heard Re-commission the boiler
	The 100°C Thermal cut-out has tripped	If the boiler is set for Radiators: Check the water circulation • Open all cocks • Clear sludge from the circuit • Check pump operation Press the red button on the Thermal Cut-out until a click is heard Re-commission the boiler
Loss of Power or Output	Fuse failure	Replace it
	Failure of the immersion elements	Refer to Section 2.19 - page 28 • Switch 'OFF' electrical supply • Drain the boiler • Disconnect the elements (note connection orientation) • Remove the fastener • Replace the faulty element • Re-commission the boiler

2.21 - Servicing

It is recommended that the boiler be installed and serviced annually by a *REDRING XPELAIR* service agent to ensure continual trouble-free operation. For details of service agents in your area, please contact:

Redring Xpelair Group
Newcombe House, Newcombe Way,
Orton Southgate
Peterborough PE2 6SE
United Kingdom

Registered office: Peterborough PE2 6SE
Registered in England N° 306008
VAT Reg N° GB 287 1315 50 038

Telephone: Redring Xpelair Group Technical Service - 08443 727766 or contact Techfax - 08443 727767

2.22 - Spare Parts List

Part	N°	PSA12
Side casing	EB06001	1
Front casing	EB06002	1
Control Panel	EB06003	1
Pump	EB06004	1
60°C cut-out	EB06005	1
100°C cut-out	EB06006	1
3 Bar relief valve	EB06007	1
8L Expansion vessel	EB06008	1
Water sensor	EB06009	1

Part	N°	PSA12
6kW Heating element	EB06010	2
Heating element gasket	EB06011	3
20A Tetrapole switch	EB06012	4
Fuse holder	EB06013	1
4A Fuse - 5 x 20	EB06014	1
Control PCB - electronic card	EB06016	1
Water temperature sensor	EB06017	1
Drain valve	EB06018	1
Drain tube	EB06019	1

2.23 - Guarantee

Terms and Conditions for the United Kingdom
(Outside of the UK contact your local distributor or point of purchase)

We, Redring Xpelair Group, guarantee this product for domestic use only, for a period of 36 months for the storage tank and 24 months for components from the date of purchase.

Within the guarantee period above, we will resolve free of charge, any manufacturing defects in the product resulting from faulty workmanship or material on condition that:-

a) The appliance has been correctly installed in accordance with these instructions and current legislation, and is being used with a supply circuit or voltage in accordance with that printed on the rating plate.

b) The appliance has been used in accordance with these instructions and has not been tampered with or otherwise been subject to misuse, neglect or accident.

c) The appliance has not been taken apart, modified or repaired except by a person authorised by us.

d) The product has been checked by a qualified engineer within the last 12 months.

For any service work to be free of charge, it must be undertaken only by Redring Xpelair Group, or our approved service agents.

Service under guarantee has no effect on the guarantee expiry date. The guarantee on any exchanged parts or product ends when the original guarantee period ends.

Evidence of the date of purchase in the form of an invoice or receipt will be required in order to qualify for an in-guarantee repair.

EXCLUSIONS

This guarantee **does not** cover damage or defects arising from poor or incorrect installation, improper use or lack of maintenance (including the build-up of limescale). It is the responsibility of the installer to check that the parameters of the product meet the installation requirements, and any relevant regulations.

If we are called out to a fault, which is subsequently identified as being an installation fault, we will make a charge. It is important that the routine checks are completed **before** calling us out, as many issues can be simply diagnosed and resolved.

We make no guarantees as to response times for repairs. We will endeavour to achieve the most timely response possible but while we may indicate an average response time, this should not be taken as a guarantee.

This guarantee applies to a repair or replacement (at our discretion) of the product subject to the conditions above, and **does not** cover compensation for the loss of the product or consequential loss of any kind.

This guarantee does not apply to the repair or replacement of pressure relief devices, safety devices, accessories, isolating switches, electrical supply cable, fuses and/or circuit breakers.

This guarantee covers products supplied by redring Xpelair Group only and does not cover other products and components used to create a system that has not been purchased from redring Xpelair Group.

This guarantee does not affect your statutory rights.

2.24 - Commissioning Checklist (to be completed in full, by the Installer)

Installer Details (Name, Address)					
Contact Phone:			**Installation date:**		
Inhibitor used:			**Inhibitor Ratio:**		
Elect Connections Checked?		**Expansion Vessel Pressure**		**System Pressure (cold)**	

Checklist	
Leak check?	
Terminal Bridges refitted?	
Forced circulation?	
Filling loop disconnected?	

Parameters set by Installer (n/a where applicable)							
1		**7**		**13**		**19**	
2		**8**		**14**		**20**	
3		**9**		**15**		**21**	
4		**10**		**16**		**22**	
5		**11**		**17**		**23**	
6		**12**		**18**		**24**	

Handover to Customer

(This page has been completed correctly; the Customer is satisfied with the installation and has been instructed in the use & operation of the boiler. This page and the Manual to remain with the Customer)

Date		**Print**	**Sign**
Installer			
Customer			